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A Reconnaissance Survey of Unnamed Lake (Sylvester Lake West)

M. J. Hunter
March 1997

PWFWCP Report No. 143

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: M. J. Hunter. March 1997. A reconnaissance survey of Unnamed Lake (Sylvester Lake West). Peace/Williston Fish and Wildlife Compensation Program, Report No. 143. 21pp plus appendices.

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105-02895/

A RECONNAISSANCE SURVEY OF

UNNAMED LAKE (SYLVESTER LAKE WEST)

WATERSHED:	**Williston Reservoir (Parsnip Reach)**
DATE OF SURVEY:	**July 9, 1996**
FIELD CREW LEADER:	**Mark Hunter**
FIELD ASSISTANT:	**Karin Mathias**
REPORT PREPARED BY:	**Mark Hunter**

BRITISH COLUMBIA CONSERVATION FOUNDATION

PEACE / WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

B. C. MINISTRY OF ENVIRONMENT, LANDS AND PARKS

FUNDED BY: FOREST RENEWAL BRITISH COLUMBIA

RELEASED BY: _____

D. J. Cadden, Regional Fisheries Biologist

LAKE: Unnamed Lake (Sylvester West) SYSTEM NAME: Nation River

A.S.A.P. REFERENCE NO.: **WATERSHED CODE: 237-3310-671-203**

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved 02 / Temp. Profiles	X
Physical Data	X	Winter Dissolved 02 / Temp. Profiles	--
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	--
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	--
Obstructions and Pollutions	X	Scale Reading	--
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	C: Fish Scale Analysis	--
History of Previous Surveys	X	Bathymetric Map Reduction	X
Water Chemistry Summary	X	Bathymetric Map	--

LOCATION

Location:	approximately 86 km west of Mackenzie		
Elevation:	1125 m ± 25 m	U.T.M.:	10.408872.6129683
Latitude / Longitude:	55°18'18" 124°26'08"	N.T.S. Map No.:	93-N/8
Management Unit:	7-28	Biogeoclimatic Zone:	Engleman Spruce - Sub-Alpine Fir
Ecoprovince:	Sub-Boreal Interior	Ecoregion:	Omineca Mountains
Ecosection:	Manson Plateau		

Drainage: Unnamed C. --> Unnamed L. (Sylvester L. East) --> Unnamed C. --> Unnamed Pond

PHYSICAL DATA

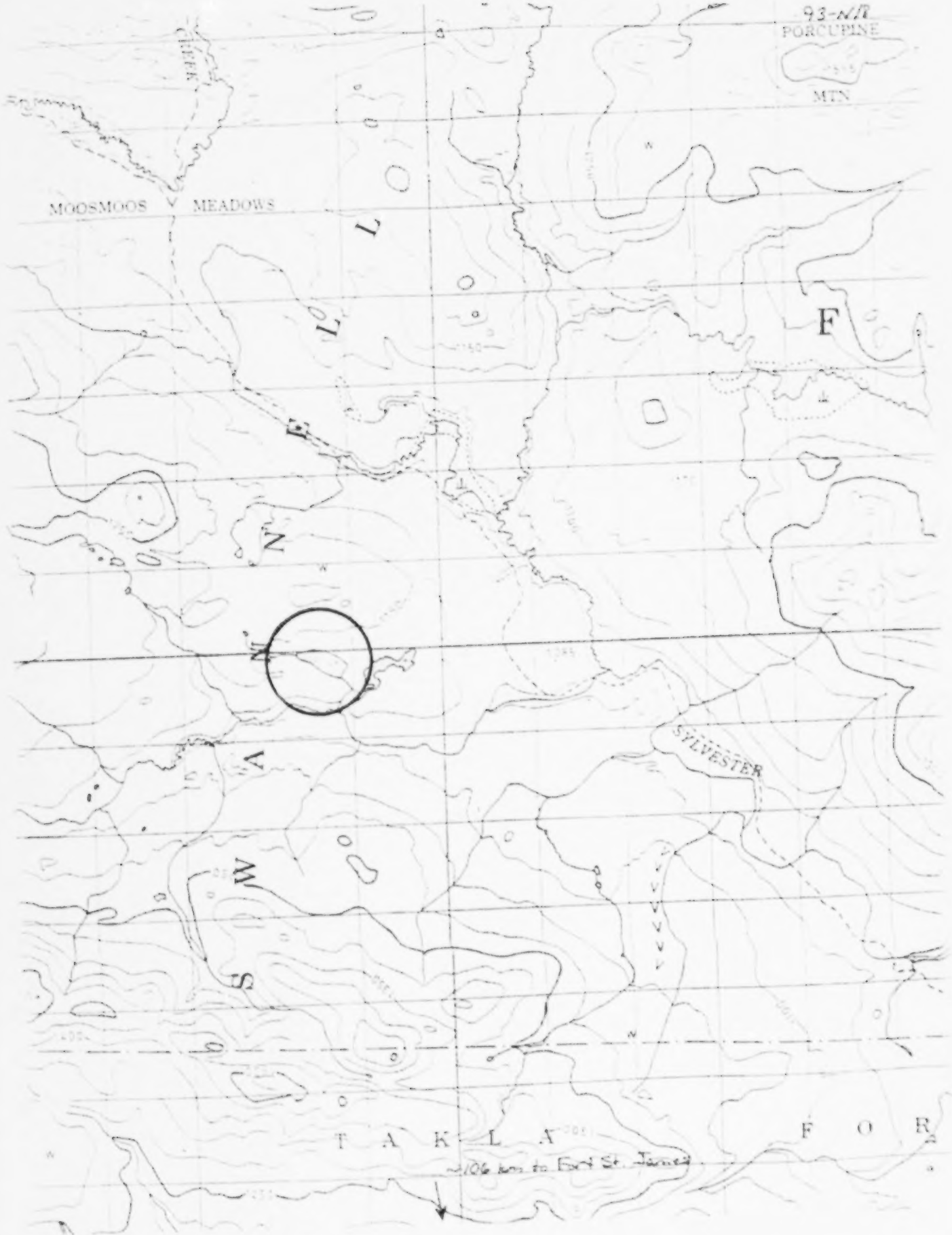
Lake Drainage Area:	1.1 km^2	Volume:	165 375 m^3
Water Surface Area:	43 237 m^2	Perimeter of Islands:	0 m
Area Above 6 m Contour:	32 935 m^2	Number of Islands:	0
Shoreline Perimeter:	1017m	Mean Depth:	3.8 m
Maximum Depth:	11.7 m	Secchi Reading:	2.65 m
Filterable Residue (TDS):	40 mg/L		

Sounding Device: Lowrance X-15 Elevation Source: Contour Interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 37 cm diameter lodgepole pine tree that is 1.4 m from the present water's edge and located in the west corner of the lake (Plate # 4).

High Water Mark: 0.15 m above water level at time of survey


93-N/11
PORCUPINE
MTN
MOOSMOOS MEADOWS
F
SYLVESTER
T A K L A
F O R
~106 kms to Fort St. James

LAKE: Unnamed Lake (Sylvester Lake West)

TERRAIN FEATURES

Immediate Shoreline:

Along the marshes in the west end of the lake, on the south shore and in the southeast corner of the lake, the shoreline is fronted by a growth of willows and sedge grasses with some spruce trees behind. Around the rest of Sylvester Lake West, the shoreline is fronted by a growth of alders and scrub birch with spruce, lodgepole pine and fir trees growing behind. Common juniper and pink mountain heather are also common plants found around the lake. The slope of the land to the north is moderately steep, while the rest of the lake has a low slope away from the shoreline.

The substrate along the southeast and along the eastern two-thirds of the north shore is gravels and cobbles with some boulders lightly covered by organics and silts. The rest of the shoreline substrate is silts and organics. Yellow waterlilies are found around the entire lake's edge, but occur most densely in front of the swamps at the west end and along the south shore of Sylvester Lake West. The lake's bottom drops off towards the center of the lake at a low slope along the south, east and west sides of the lake, and at a moderately steep slope along the north shore.

Surrounding Country:

Sylvester Lake West is surrounded by a mature forest of spruce, lodgepole pine and fir trees growing on rolling hills to the north, east and west, and on low hills to the south. Mountains can be seen in the distance to the south. An unnamed lake (Sylvester Lake East) is located approximately 0.25 km to the east. Sylvester Lake West is situated within the Engleman Spruce - Sub-Alpine Fir biogeoclimatic zone.

LAKE: Unnamed Lake (Sylvester Lake West)

ACCESS

Directions:

From the junction of Highway 27, the Teardrop Forest Service Road and the Germansen Landing North Road, drive north on the Germansen Landing North Road for approximately 100 km, then continue north on the Thutade Forest Service Road for approximately 14 km. Turn left onto the Sylvester Main Line, and drive for approximately 10.5 km. Turn left again onto a logging road, and travel for approximately 3 km to the second clear cut. From this clear cut, Sylvester Lake East is approximately a 4.5 km helicopter ride to the northwest.

Road Type and Conditions:

The Germansen Landing North Road and the Thutade Forest Service Road are both well-maintained, two-lane gravel roads that are easily accessible with two-wheel drive vehicles. The Sylvester Main Line is rough in some places, but can be traveled with a two-wheel drive truck. The logging road is very rough in some places, and a four-wheel drive vehicle is recommended for crossing some of the cross ditches in the road.

Restrictions:

None known.

RESORTS AND CAMPSITES

There are no resorts or campsites located on Sylvester Lake West.

OTHER DEVELOPMENTS

None noted.

OBSTRUCTIONS AND POLLUTIONS

None noted.

LAKE: Unnamed Lake (Sylvester Lake West)
SPECIAL RESTRICTIONS

None known.

AQUATIC PLANTS
The following aquatic plants were identified during the time of the survey:

yellow waterlilies (Nuphar sp.)Equisetum sp.
sedge grasses

WILDLIFE OBSERVATIONS

The following wildlife or signs were seen during the time of the survey:

cow moose and moose droppings	bear scat
coyote heard and coyote droppings	squirrel
various songbirds	golden-eye hen with seven ducklings

MISCELLANEOUS COMMENTS

1) Lots of caddis flies, damsel flies, may flies and chironomids were seen on / in the water.

2) The outlet creek flows into an unnamed lake to the east (Sylvester Lake East), not intc Sylvester Creek as shown on the 1:50,000 N.T.S. maps. During times of high water, the outlet creek may flood over it's banks and there may be some flow over the forest floor to the south towards the unnamed creek that the N.T.S. map shows the outlet flowing into.

3) A forest Recreation Site could easily be built along the east shore of Sylvester Lake West that could provide access to both of the lakes. Access to that point would have to be pushed in from the east near where the helicopter site is situated.

4) Bathymetric map: The lake outline was drawn from an enlargement of air photo 30 BCB 94065: No. 100, flown August 27, 1994.

LAKE: Unnamed Lake (Sylvester Lake West)

LAKE DRAINAGE

General:

Two inlet creeks feed into Sylvester Lake West, one from the north and one from the west. The outlet creek drains the lake to the east and flows for approximately 0.8 km into an unnamed lake (Sylvester Lake East). Another unnamed creek drains this lake to the east, and flows for approximately 0.035 km to drain into a small pond in a bowl of land. The pond has no outlet.

Major Systems:

There are no major systems.

Minor Systems:

Inlet # 1 - Unnamed Creek

Inlet # 1 enters Sylvester Lake West in the west end of the lake (Plate # 5). For the first 15 m, Inlet # 1 has an average wetted width of 1.5 m and depth of 0.7 m, with an organic bottom. Approximately 15 m upstream from the lake, the channel braids into two. The right channel (looking upstream) has an average wetted width of 1.0 m and depth of 0.5 m, and has an organic bottom. Approximately 25 m upstream from the lake, the channel goes underground.

The left channel is the main channel. It has an average wetted width of 1.0 m and depth of 0.6 m. Approximately 25 m upstream from the lake, there is 0.6 m high falls that is overgrown by willows. Approximately 45 m upstream from the lake, there is a second falls that is 1.0 m high and probably did not have enough flow over the top to allow for upstream fish passage at the time of the survey. Approximately 100 m upstream from the lake, the channel becomes braided. Upstream of approximately 150 m from the lake, the channel frequently goes underground for up to 4 m. Approximately 200 m upstream from the lake, the channel goes underground for good. Inlet # 1 had no fisheries potential during the survey period.

Inlet # 2 - Unnamed Lake

Inlet # 2 enters Sylvester Lake West in the middle of the north shore and has an average wetted width of 0.5 m and depth of 0.1 m. The substrate is fines and organics. Approximately 20 m upstream from the lake, Inlet # 2 goes underground. Inlet # 2 had no fisheries potential during the survey period.

LAKE: Unnamed Lake (Sylvester Lake West)

Outlet - Unnamed Creek

The outlet creek drains Sylvester Lake West to the east (Plate # 6). Approximately 100 m downstream from the lake, a pine tree has fallen across the channel that may hinder or block fish passage. Approximately 115 m downstream, the channel braids into two, both of which go underground for 2.5 m before they resurfaced. Approximately 140 m downstream of the lake, the channel goes underground again for 6 m. At the point where it resurfaces, large cobble and boulders becomes present in addition to the previous small cobbles, gravels and fines. Approximately 800 m downstream from Sylvester Lake West, the creek flows into an Unnamed Lake (Sylvester Lake East). The channel is heavily overgrown with alders over the last two-thirds of it's length.

A Stream Survey card was completed for a sample site located approximately 170 m downstream from the lake (Plates # 7 - # 8). The average wetted width is 0.6 m and the average maximum riffle depth is 0.2 m. The substrate is comprised of fines (50%), cobbles (35%) and boulders (15%). The creek morphology is mainly riffles (45%) and runs (45%) with some pools (10%). Although there is no good spawning habitat in the sample site, there are some patches of gravels in other parts of the outlet creek. For additional information, refer to Appendix B.

LAKE: Unnamed Lake (Sylvester Lake West)

FISHERIES MANAGEMENT COMMENTS

Sylvester Lake West is an ideal lake for stocking due to the absence of any fish species in the lake, and that other than the Unnamed Lake (Sylvester Lake East) it is connected to by the outlet creek, it is in a closed system. As well, Sylvester Lake West has enough vegetation and aquatic plants that it should be able to provide enough food to maintain a population of fish. Numerous caddis flies, damsel flies, may flies and chironomids were seen in addition to some Gammerus. This system of two lakes may be good lakes into which Arctic grayling could be transplant. If Arctic grayling were to be transplanted into Sylvester Lake West, they could be caught in the Nation River so as to remove any chance that the natural stocks could be affected. If the lake was to be stocked, some work done on the outlet creek would provide good spawning habitat to make the lake self-sufficient with regards to maintaining a fish population. Removing the sections of land under which the outlet creek flows would ensure access to all parts of the creek. The placement of some spawning gravel would ensure that spawning would be possible. If the lake is stocked, a winter oxygen / temperature profile should be completed for Sylvester Lake West to ensure that any stocked fish would not be exposed to winter-kill situations.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Studies:

None known.

LAKE: Unnamed Lake (Sylvester Lake West)

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	July 9, 1996		
Time:	1215 hrs	Air Temperature:	14.5 °C
Wind Velocity:	15 - 20 km/h	Wind Direction:	from the E
Cloud Cover:	8 / 10 o.c.	Surface Conditions:	rippled
Secchi Disc:	2.65 m	Water Colour:	tea colour

Method Used:

Dissolved Oxygen:	YSI Model 57 Oxygen / Temperature Meter
Water Temperature:	YSI Model 57 Oxygen / Temperature Meter
Air Temperature:	Hand-Held Alcohol Thermometer
pH (field):	Digital pH Pocket Tester
H2S (field):	Hach H2S Field Test Kit
Laboratory Used:	Pacific Environmental Science Center
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Metal Sampler:	By Hand; Preserved With 2.0 mL Nitric Acid
Substrate Sampler:	Substrate Sample Not Taken

Water Sample Chemistry: **SEAM Site No.:** E 223171

	Sampling Depths	
	Surface (0.5 m)	Lower (10.5 m)
Alkalinity (lab)	11.8 mg / L	15.2 mg / L
Filterable Residue 105°C (lab)	40 mg / L	40 mg / L
H2S (field)	N/A	0mg / L
Nitrogen - Total (lab)	0.31 mg / L	0.31 mg / L
Non-Filterable Residue (lab)	< 5 mg / L	< 5 mg / L
pH (field)	8.0	7.1
pH (lab)	7.08	6.56
Phosphorus - Total Dissolved (lab)	0.009 mg / L	0.013 mg / L
Specific Conductance (lab)	33 .µS / cm	41 µS / cm

Bottom Depth:	11.5
Substrate Sample Depth:	N/A

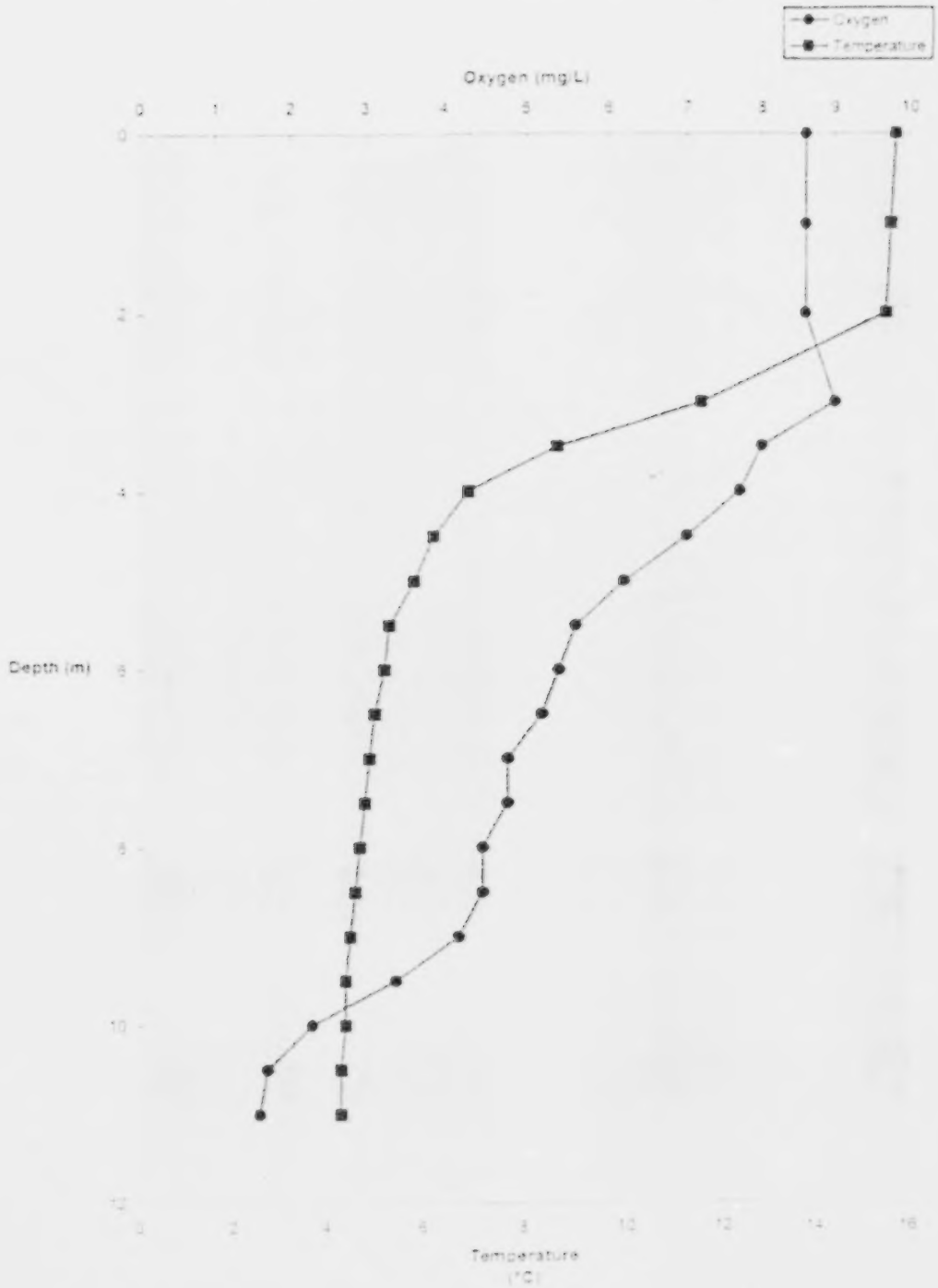
* additional analyzed parameters and results, including metals, are found in Appendix 1

LAKE: Unnamed Lake (Sylvester Lake West)

SUMMER OXYGEN / TEMPERATURE DATA

DEPTH (m)	02 (mg/L)	TEMPERATURE (°C)
Surface	8.6	15.7
1.0	8.6	15.6
2.0	8.6	15.5
3.0	9.0	11.5
3.5	8.0	8.6
4.0	7.7	6.9
4.5	7.0	6.2
5.0	6.2	5.8
5.5	5.6	5.3
6.0	5.4	5.2
6.5	5.2	5.0
7.0	4.8	4.9
7.5	4.8	4.8
8.0	4.5	4.7
8.5	4.5	4.6
9.0	4.2	4.5
9.5	3.4	4.4
10.0	2.3	4.4
10.5	1.7	4.3
11.0	1.6	4.3
11.5	Bottom	

SUMMER OXYGEN / TEMPERATURE PROFILE



LAKE: Unnamed Lake (Sylvester Lake West)

NETTING RECORD

Mesh Size Experimental Order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 1

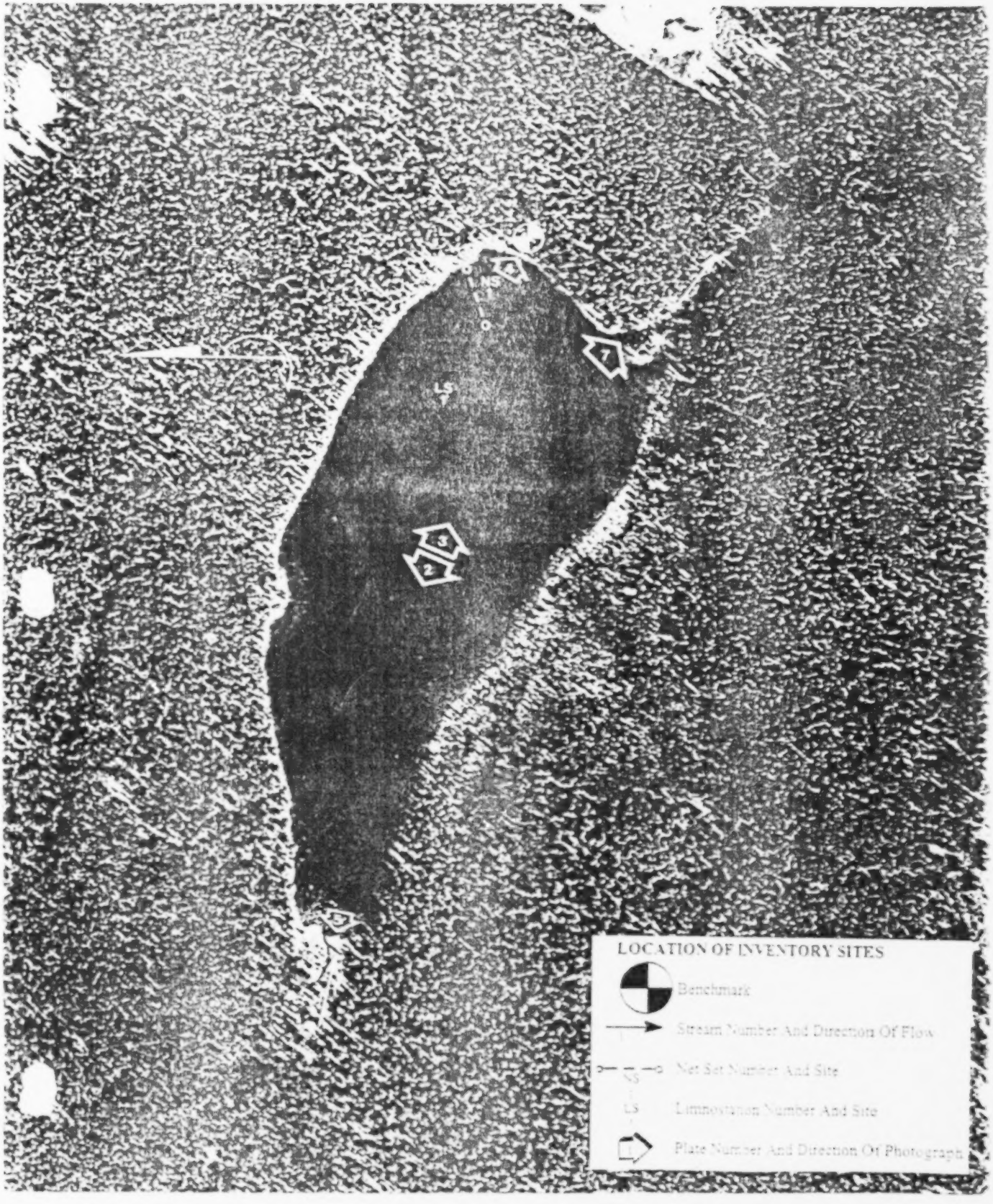
Type:	Sinking Monofilament Gill Net			
Date Set:	July 9, 1996		Time:	1010 hrs
Date Lifted:	July 9, 1996		Time:	1600 hrs
Net Dimensions:	Length:	91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm		Depth:	0.7 m
			Substrate:	cobbles
Deep End Mesh Size:	64 mm		Depth:	9.0 m
			Substrate:	fines

Comments: Net empty.

Minnow Traps:

Bait: Sardines

Trap No.	Hours	Depth (m)	Substrate	Species	No. Caught	Size Range (cm)
1	5:50	0.7	silt / organics over cobble	leech	1	-
2	5:50	0.6	silt / organics over cobble	leech	1	-
	5:50	0.6	organics	leech	14	-


LOCATION OF INVENTORY SITES
Benchmark
Stream Number And Direction Of Flow
SS
Net Set Number And Site
LS
Limnovarium Number And Site
Plate Number And Direction Of Photograph

LAKE: Unnamed Lake (Sylvester Lake West)

Plate	Roll : Number	Description
1	4: 5	Aerial view of Unnamed Lake (Sylvester Lake West) looking east. Note Unnamed Lake (Sylvester Lake East) in the background.
2	4: 14,16	Panoramic view of Unnamed Lake (Sylvester Lake West) looking west from the center of the lake.
3	4: 10, 11, 13	Panoramic view of Unnamed Lake (Sylvester Lake West) looking east from the center of the lake.
4	4: 8	View of the benchmark located 2.0 m above present water level in a 37 cm diameter Lodgepole pine tree that is 1.4 m from the present water's edge and located in the west corner of the Unnamed Lake (Sylvester Lake West).
5	4:21	View of the mouth of Inlet # 1 where it enters Unnamed Lake (Sylvester Lake West) in the west end of the lake.
6	4: 17	View of the mouth of the outlet where it drains Unnamed Lake (Sylvester Lake West) to the east. Note the LWD jam at the mouth of the outlet.
7	4: 18	Upstream view of the sample site on the outlet, taken approximately 170 m downstream of Unnamed Lake (Sylvester Lake West).
8	4: 20	Downstream view of the sample site on the outlet, taken approximately 160 m downstream of Unnamed Lake (Sylvester Lake West).

LAKE: Unnamed Lake (Sylvester Lake West)

Plate # 1: Aerial view of Unnamed Lake (Sylvester Lake West) looking east. Note Unnamed Lake (Sylvester Lake East) in the background.

LAKE: Unnamed Lake (Sylvester Lake West)

Plate #2: Panoramic view of Unnamed Lake (Sylvester Lake West) looking west from the center of the lake.

LAKE: Unnamed Lake (Sylvester Lake West)

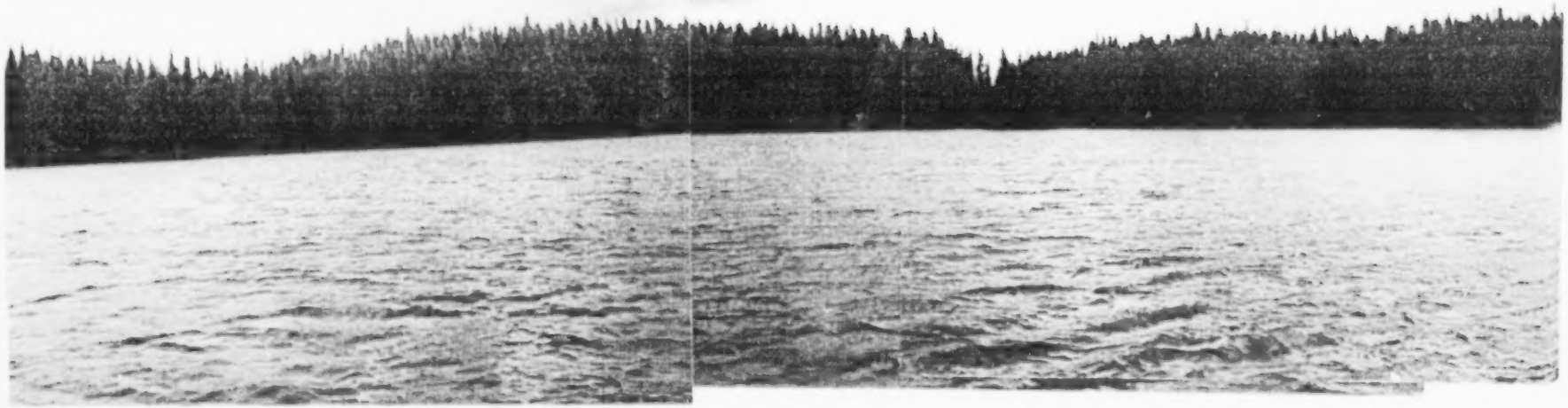


Plate #3: Panoramic view of Unnamed Lake (Sylvester Lake West) looking east from the center of the lake.

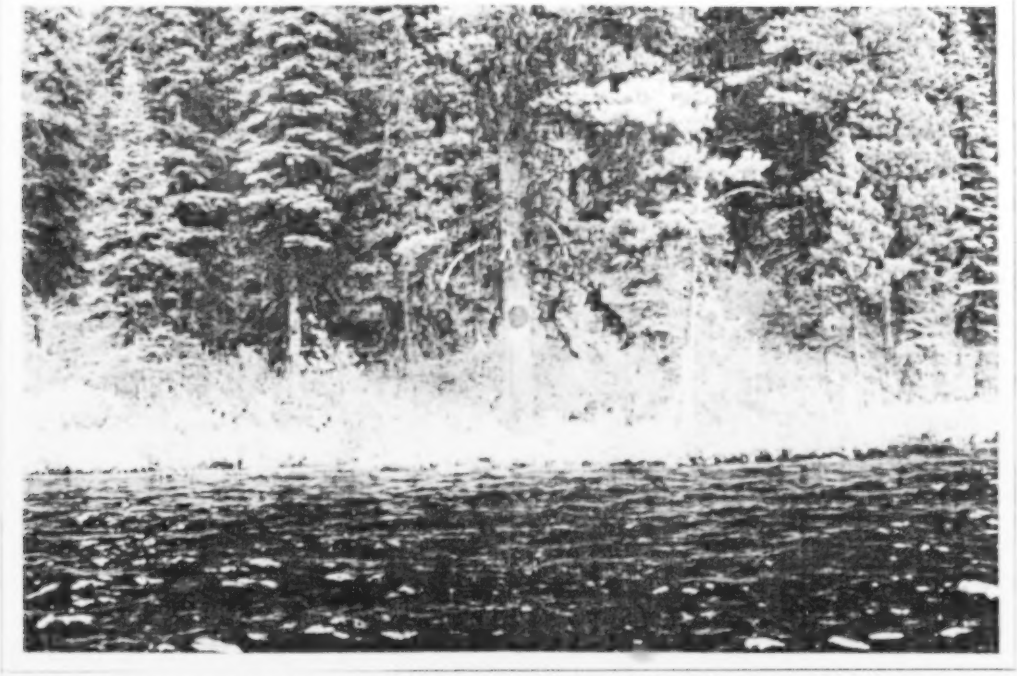


Plate # 4: View of the benchmark located 2.0 in above present water level in a 37 cm diameter Lodgepole pine tree that is 1.4 m from the present water's edge and located in the west corner of the Unnamed Lake (Sylvester Lake West).

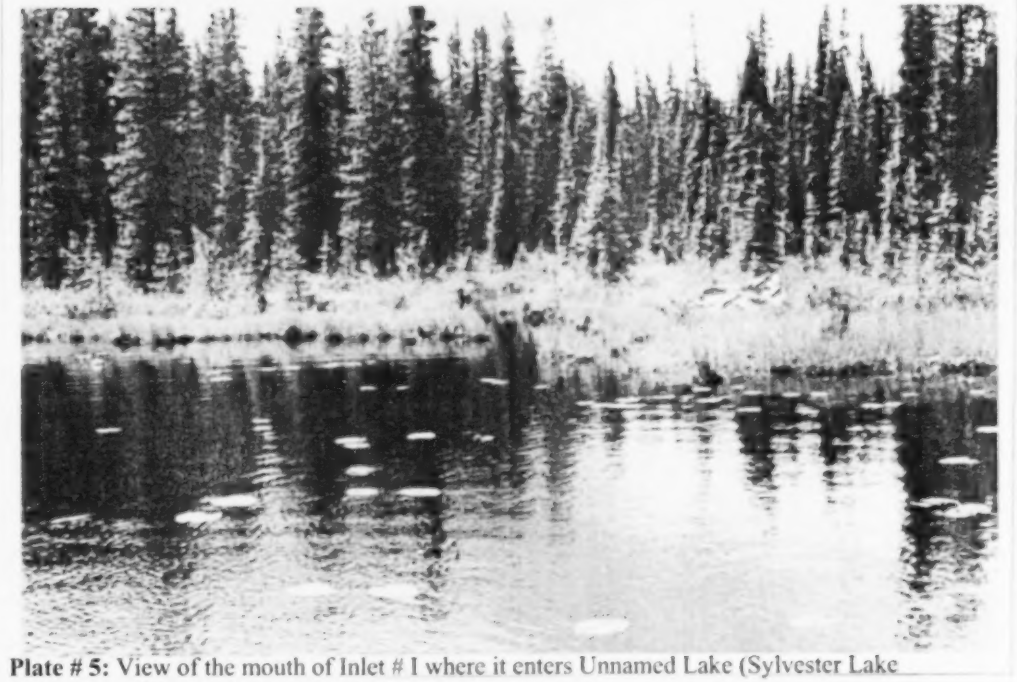


Plate # 5: View of the mouth of Inlet # I where it enters Unnamed Lake (Sylvester Lake West) in the west end of the lake.

LAKE: Unnamed Lake (Sylvester Lake West)

Plate # 6: View of the mouth of the outlet where it drains Unnamed Lake (Sylvester Lake West) to the east. Note the LWD jam at the mouth of the outlet.

Plate # 7: Upstream view of the sample site on the outlet, taken approximately 170 m downstream of Unnamed Lake (Sylvester Lake West).

LAKE: Unnamed Lake (Sylvester Lake West)

Plate # 8: Downstream view of the sample site on the outlet, taken approximately 160 m downstream of Unnamed Lake (Sylvester Lake West).

Appendix A

LABORATORY REPORT

Water Chemistry Analysis

RESULTS FOR UNNAMED LK-SYVESTER WEST E223171 SAMPLES

Parameter Analyzed		Units	96/07/09 0.5M 962934-001	96/07/09 10.5M 962934-002
ALKALINITY		mg/l	11.8	15.2
CONDUCTIVITY		uS/cm	33	41
METALS/TOTAL (WATER-ICP)	AG	mg/l	<.01	-
	AL	mg/l	.15	-
	AS	mg/l	<.06	-
	B	mg/l	<.01	-
	BA	mg/l	<.001	-
	BE	mg/l	<.001	-
	CA	mg/l	4.7	-
	CD	mg/l	<.006	-
	CO	mg/l	<.006	-
	CR	mg/l	<.006	-
	CU	mg/l	.006	-
	FE	mg/l	.11	-
	K	mg/l	<.1	-
	MG	mg/l	1	-
	MN	mg/l	.004	-
	MO	mg/l	<.01	-
	NA	mg/l	.6	-
	NI	mg/l	<.02	-
	P	mg/l	<.1	-
	PB	mg/l	<.06	-
	SB	mg/l	<.06	-
	SE	mg/l	<.06	-
	SI	mg/l	2.13	-
	SN	mg/l	<.06	-
	SR	mg/l	.013	-
	TI	mg/l	.004	-
	V	mg/l	<.01	-
	ZN	mg/l	.003	-
NITROGEN/AMMONIA		mg/l	.032	.013
/NITRITE		mg/l	.002	.003
/NITRITE+NITRATE		mg/l	.003	.01
/TOTAL		mg/l	.31	.31
PH		Rel.U.	7.08	6.56
PHOSPHORUS/O-PO4		mg/l	<.001	<.001
/TOTAL		mg/l	.012	.017
[illegible] DISSOLVED		mg/l	.009	.013
RESIDUE/FILTERABLE		mg/l	40	40
/NON-FILTERABLE		mg/l	<5	<5

Appendix B

Tributary Stream Data

D.F.O. / M.O.E. Stream Survey Form

DFO / MOE

STREAM SURVEY FORM

Stream Name

Watershed Code

Location

Date (DMD)

Agency

Crew

C	PARAMETER	VALUE	METH
	Ave Chan Width (m)		
	Ave Wet Width (m)		
	Ave Max Riffle Depth (m)		
	Ave Max Pool Depth (m)		
	Gradient %		
	% Pool / Riffle		
	Side Cut %		
	Active Channel Width (m)		
	Bankfull Width (m)		
	Bankfull Depth (m)		
	Bankfull Area (m²)		
	Stability %		
	Cover Type %		
	Cover Amount %		
	Wetland %		

SPECIFIC DATA

C	BED MATERIAL	%
	Fines (<2 mm)	
	Gravel (2-64 mm)	
	Cobbles (64-256 mm)	
	Large Cobbles (256-4096 mm)	
	Boulders (>4096 mm)	
	Bedrock	

C	BANKS
	Material
	Erosion

C	OBSTRUCTIONS	Type

DISCHARGE

	Parameter	Value	Meth	Specific Data
	Wetted Width (m)			
	Mean Depth (m)			
	Mean Velocity (m/s)			
	Discharge (m³/s)			

REACH SYMBOL

FISH SUMMARY

C	Species	No.	Size Range (mm)	Life Phase	Method/Ref.

STREAM VALLEY CROSS-SECTION

L R

PLANIMETRIC VIEW

COMMENTS

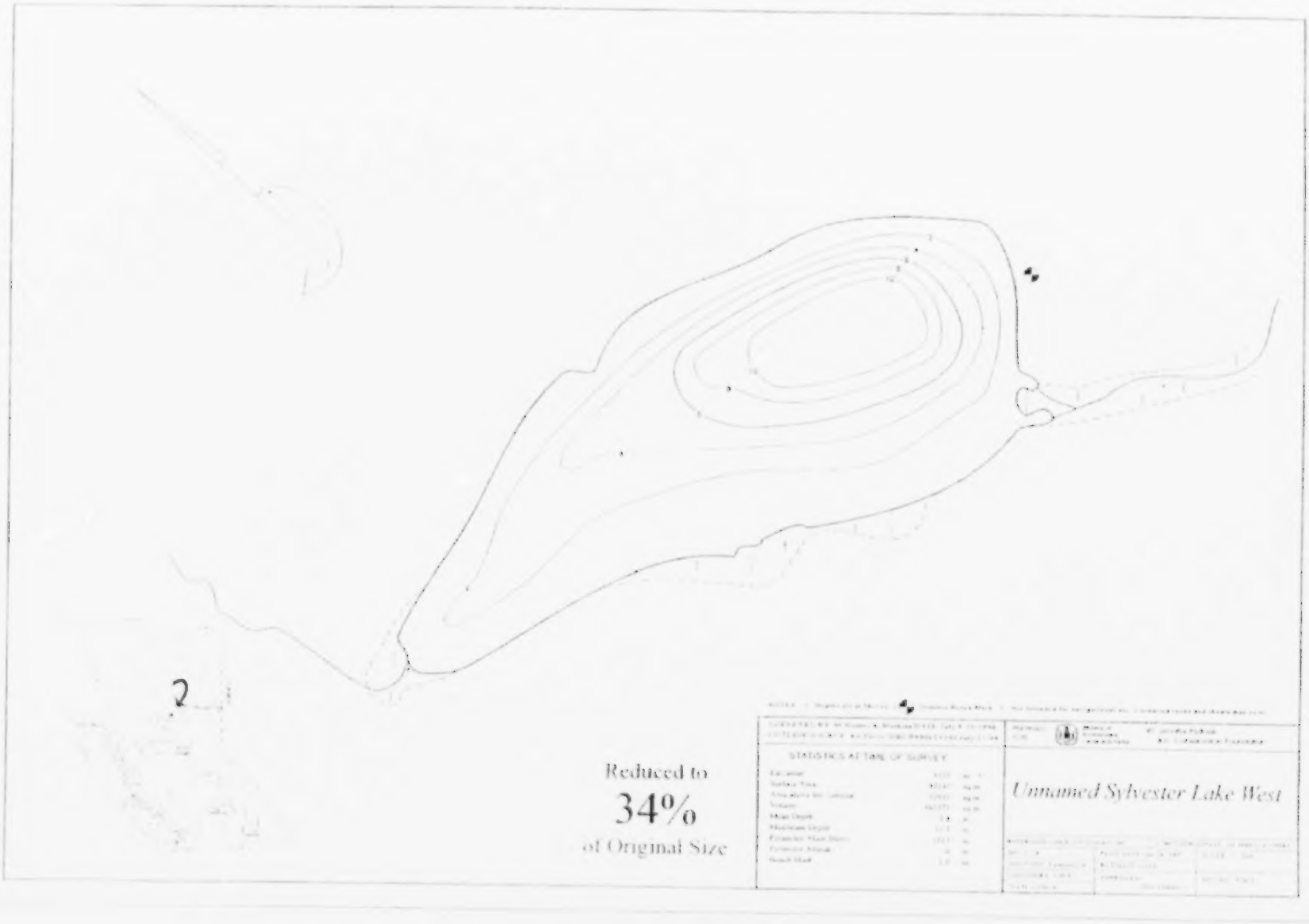
Channel Stability | Debris | Pools/Riffles | Undercuts | Obstructions | Riparian Zone | Fish Habitat Potentials | Other

1

2

Appendix C

BATHYMETRIC MAP



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